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Historicising the Hydrosocial Cycle

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ABSTRACT: This paper examines the historical claims made in support of the hydrosocial cycle. In particular, it considers how arguments advancing the hydrosocial cycle make historical claims regarding modernist conceptions of what water is (i.e. H_2O) and its fit with society. The paper gives special emphasis to the society/nature dualism and to the notion of agency as key sites of contest in arguments regarding the hydrosocial cycle. It finds that, while several versions of the hydrosocial cycle seek to advance a political ecology more sensitive to non-human actions, these same accounts often do not address the robust account of non-human agency in the historical record. Evidence is presented regarding water's agency amongst late 19th and early 20th century architects of key water management norms in the United States. This evidence troubles accounts of the hydrosocial cycle that critique the US experience and suggests new directions for rethinking the role of historical and institutional norms in water policy.

KEYWORDS: Hydrosocial cycle, agency, modernity, W.J. McGee, vitalism, United States

INTRODUCTION

It is an interesting exercise to have students draw, or at least imagine, the hydrological cycle. The results are usually fairly uniform: arrows linking evaporation, transpiration, groundwater percolation and precipitation amongst oceans, land and freshwater rivers and lakes. Sometimes the odd glacier makes the cut. Often, the cycle proceeds in one, big, circular pattern. And almost without fail, the cycle is devoid of people, cities, other species, or life in general. This shared mental model provides a point of departure for asking whether the hydrological cycle really exists 'out there' as a natural backdrop for human activity: doesn't water flow otherwise? Isn't it entangled with biogeochemical processes, other species, and the practices that different societies have developed to support alternate forms of life? If so, how should we conceptualise the multitude of forces acting upon water?

Admittedly, the impetus for the exercise is not original. It came from the literature on the 'hydrosocial cycle' and critiques of how modern dualisms between society and nature affect understandings of both what water is and how water fits with society. Yet not all accounts of the hydrosocial cycle are created equal. This paper examines those that make historical claims about water as part of a nature/society dualism. After reviewing the literature, two arguments are forwarded: the first shows how water's agency figured into the US tradition of water management critiqued by several proponents of the hydrosocial cycle. The second suggests that, once we examine the historical claims embedded in arguments for the hydrosocial cycle, we must address the notions of non-human agency that they overlook. These exhibit a version of vitalism, itself forwarded within a broader anthropological vision. Although that vision has since atrophied, the institutional and policy orientations it gave rise to persist. As such, contemporary arguments for water's agency as part of an active, hydrosocial relationship must be put in this historical context in order to determine what hydrosocial critiques offer to contemporary policy puzzles.

WHAT IS THE HYDROSOCIAL CYCLE?

There are at least two sources for the idea of the hydrosocial cycle. One operates in reference to social contract theories, such as those found in the political philosophy of Thomas Hobbes or John Locke (Turton et al., 2001). On this account, there is a hydrosocial contract working at the intersection of water management, social and legal norms, the state and the environment. Therein, a set of judgments about the nature of sovereignty, the rights of individuals, hydrology, water resources and social norms embed water in social space. This version of the hydrosocial cycle is not the one being examined in this paper.

A second version of the hydrosocial cycle posits and critiques a society/nature dualism for how it implicates modern categories of thought that sort things to 'society' on the one hand, and 'nature' on the other; Or, as Latour (1993) put in the majuscule, Society and Nature. Latour (1993) argued that the conceptual topology of modernity is what allows water, and non-human things in general, to be sorted to Nature. This is accomplished by first translating objects into mixtures of social and natural forces. Then, in a task of purification, these new objects are sorted to either Society or Nature. As is well known, Latour claims "we have never been modern" because objects fail to conform to the poles of Society or Nature and rapidly traverse between them as so many hybrids. Likewise, accounts of the hydrosocial cycle that seek to identify water's hybrid, socio-nature often aim to show how water resists classification as wholly social or only natural. In so doing, water's refused contortion to Society or Nature is taken as evidence that water is not part of 'neutral nature' and recommends a type of action that is not unique to human agency. In short, water acts. Following Latour, water is an actant. Furthermore, other non-human things act upon water: other species, urban infrastructure, biogeochemical cycles, and so on. Here, accounts of the hydrosocial cycle seek to treat the deep plurality of water and its relations as a socio-natural thing(s).

Not all advocates of the second version of the hydrosocial cycle motivate their arguments in reference to Latour. But to critique water policy and management as distinctively modern, proponents often make claims that anchor human-water relations in (failed) attempts to organise relationships to water based on a society/nature dualism. In this way, a heuristic operates in many accounts of the hydrosocial cycle that suggests social, political and non-human relationships have affected water in the past even if those effects were not recognised or explicitly part of policy, management or governance decisions. These claims proceed along at least two dimensions that structure this section: (1) claims regarding the kind of thing water is, and (2) claims regarding the fit of water with society.

What kind of thing is water?

Hamlin's (2000) historical account suggested that the possibility of a singular answer to questions regarding what water is was made possible by a modernist reduction of multiple ontological kinds of water to one, discrete form: H_2O. According to Gregory (2001), late 19th century trends in scientific reductionism produced a kind of mathematically and chemically determined water, one which fit with the kind of Nature being produced by broader colonial exercises that used state and scientific rationality to displace claims articulated under alternate forms of life and, in so doing, dispossess others of water. Linton (2008, 2010) picks up on these themes and seeks to connect a reductionist account of water (*qua* H_2O) to the conceptual development of an abstract, hydrological cycle. The aim of Linton's (2010: 107) account is to treat the hydrological cycle as a "hydrosocial phenomenon, albeit one that represents water in a way that erases its own social content". Linton's claim is that the hydrological cycle emerges from a particular social context that is denied as having any substantive effect on the hydrological cycle. Rather, the hydrological cycle operates akin to a 'mirror of nature' wherein no image of society is reflected back.

Linton (2010: 223) further argues that, if we see the hydrological cycle as socially constructed, then the scientific abstractions that create the 'hydrological cycle' as a socially free space also cordon off

non-modern ways of knowing water. In this way, the hydrological cycle presents abstract ways of thinking about both water and social relations. To support this claim, Linton (2010) links H_2O to the state through the early 20th century declaration by William J. McGee (1909) that water is a resource. This line of argument follows Hays' (1959) thesis that the early 20th century conservation movement in the United States was primarily scientific and technological in its drive to maximise efficiency in natural resources development. This corresponds to other accounts that confirm McGee was very influential in the early 20th century, particularly in forming the philosophical context for the idea of conservation and for multi-purpose river basin development in America, which laid the groundwork for watershed management in the Tennessee Valley Authority (Cross, 1953; Ross, 1975; Lacey, 1979; Wescoat, 2000). Notwithstanding the evolution of watershed management elsewhere, such as Spain, McGee's influence on the way that water resources were inventoried and governed is formative for what Linton (2010) terms 'modern water'.

How do water resources fit with society?

Linking the reductionist account of water to a modernist vision of society is a second dimension of crafting the historical narrative that the hydrosocial cycle seeks to confront. In this project, there are divergent explanations of what type of society is allowed for, or in some versions produced, within modernity. Frequently, there is an appeal to James C. Scott's (1998) arguments regarding 'high modernism'. In Scott's view, high modernism involved the translation of Nature into 'natural resources' in a manner similar to how Linton (2010) claims that McGee declared 'water a resource' through state inventories and scientific standardisation. But as Scott (1998) argues, these changes were coordinated with an effort to govern an abstracted ideal of society – the population – that was made legible through forms of state rationality that emphasised scientific, technological and bureaucratic control. This social vision was installed over, and often at the expense of, local or customary practices. Thus, even if not all accounts rely on a constructionist version of the hydrological cycle, many of them at least implicitly build off the idea that in modernity water becomes the kind of thing that fits with a modern vision of society (i.e. Swyngedouw, 1999; Molle, 2009; Hirsch, 2010).

Frequently, a secondary argument is made to reinforce the link between water resources and state rationality. This is found in arguments regarding the re-scaling of water to river basins or watersheds as the 'natural unit' for managing water resources in service to a population within high modernity (e.g. Cohen and Davidson, 2011; Clarke-Sather, 2012). Many of these arguments cite Scott's (1998) comment that the regional development plans of the Tennessee Valley Authority (TVA) in the United States were the "granddaddy" of high modernism. Scott's arguments for this claim are found in a later publication where he examines how the TVA experimented with both top-down and bottom-up approaches to governance (see Scott, 2006). Nevertheless, the linking of the 'watershed' concept to high modernism has also allowed the concept to be critiqued as a political platform linking water policy, socioeconomic and political power – not a natural unit for governance (Warner et al., 2008; Molle, 2009).

Karl Wittfogel (1957: 3) formulated an alternative way to link water to socioeconomic and political power by arguing that a 'geo-institutional nexus' gave rise to specific forms of hydraulic societies. Developments and critiques of the adjustments Wittfogel made to the theories of Marx and Weber have shown how attending to governance institutions and processes can expose the traffic that produces modernist claims about water, on the one hand, and society, on the other (e.g. Worster, 1992; Banister, 2013). In this way, Wittfogel's work has been used to link socio-technical interventions to the co-production of 'nature' and 'society' within the broader political economy and political ecology of the state (Swyngedouw, 2004, 2009).

The attention to governance institutions and processes, as well as socio-technical constellations, offer a register for situating the hydrosocial cycle amidst the power relationships that affect techniques for linking water and society in terms of things like water's economic value, rights regimes, the design of urban and peri-urban water service systems or the fit of water with other policy domains like

agriculture or energy. Hydrosocial critiques of these types of techniques highlight how the evacuation of water from *existing* social spaces generates both internal and external tensions in subsequent governance arrangements (e.g. Bakker, 2002; Swyngedouw, 2004, 2005; Kaika, 2005). New governance techniques are often criticised, within and beyond the specific literature on the hydrosocial cycle, for presuming upon modern rationality, particularly where they do social and ecological violence to the customary rights of established social practices (Espeland, 1998; Whiteley et al., 2008; Bakker, 2010; Boelens et al., 2010).

In summary, abstract claims regarding what water is (i.e. H_2O) and the fit of that kind of thing – including its cycling in the hydrological cycle – with a modern version of society together form the nexus that the hydrosocial cycle seeks to confront (see also Linton, 2008; Budds, 2009). This is not to declare or defend a claim that all accounts of the hydrosocial cycle are of a piece. There are important differences among them regarding both the specific historical and cultural contexts they confront and the proposals they advance. Nevertheless, there are often common points of contact regarding the refusal of the nature/society dualism; in their recent summary article, Linton and Budds (2013) reaffirm this distinction as central to numerous accounts of the hydrosocial cycle.

But is the refusal of the nature/society dualism historically appropriate? That is, did earlier water managers and policy-makers ignore water's hydro-social action? If they did, then refusing this dualism may get us purchase on the practices, techniques and norms that hid the social content of things claimed to be objective, or to otherwise operate outside of social space. But if they did not, as I will argue below, then we must rethink how *earlier versions* of the hydrosocial cycle should affect and augment contemporary accounts. And this will set us into a new set of policy puzzles, for if we accept that nature and society were not earlier divorced, then we will need to reconsider the heuristic devices applied across categories like 'society' and 'nature' in histories of the hydrosocial cycle itself (see generally Roth, 2002).

WATER'S AGENCY

Is modern water management premised on an understanding of H_2O as a passive object shunted about by science, technology and bureaucracy in accordance with forms of state rationality? It does not seem so in the case of the United States. In fact, the very idea that water is a resource was not a grand reduction of Nature to 'natural resources' nor was it a sorting practice of water within the polarity of Society and Nature. Rather, water was seen as the bridge between life and non-life and H_2O was seen as the active agent in the evolution of societies and institutions.

The account offered here focuses on the American case. As such, it has its limits. But these limits should be tempered in four ways: first, through the recognition of recent scholarship regarding how American water management was forwarded throughout the 20th century as a model for spreading the norms of liberal democracy alongside expertise in water development (Teisch, 2011; Sneddon and Fox, 2011; Sneddon, 2012). Second, by acknowledging how the American water management experience later comes to affect international development institutions, such as the World Bank (Morris, 1963; Mason and Asher, 1973; Scott, 2006; Bakker, 2013). Third, by noting that the US experience has frequently, albeit at times uncritically, been used as a template for educating global water managers (Briscoe, 2010). Finally, and perhaps most saliently, by recognising that many accounts of the hydrosocial cycle rely on *critiques* of the American experience.

In this context, the next two subsections present a case for seeing how the notion of water's agency exists in a pronounced manner within the American tradition. The outcome of the argument is that, rather than the hydrosocial cycle appearing as a refusal of the society/nature dualism, water is approached in line with what anthropologist Marcel Mauss (1990) described as a total social fact, where expressions in one domain reverberate through multiple registers of social life at one and the same time. From this perspective, we can begin to orient the anthropological assumptions of water

management itself (see Orlove and Caton, 2010). Such a view is particularly relevant because early American water managers such as John Wesley Powell and W.J. McGee were also anthropologists. To see how water's agency is explicitly recognised I follow the same format as above, asking (1) what is water? and (2) how do water resources fit with society?

What is water?

Linton (2010) correctly argues that W.J. McGee was a key figure in the nexus formed between H_2O and state resource planning in the United States. McGee has been credited, insofar as ideas can belong to anybody, with the ideas of both conservation and of multi-purpose river basin development in America (Cross, 1953; Lacey, 1979). But it is not correct to claim that McGee premised this union on a society/nature dualism or on water as an inactive agent. Rather, McGee used his position as a geologist and anthropologist in the late 19th and early 20th century to craft a broad theory that saw water as the vital link between life and non-life. Water was, in McGee's view, the active agent of evolution. What was McGee's view? Why did it matter? And how did his version of vitalism atrophy into the anthropological lens that seems almost invisible in contemporary claims about the hydrosocial cycle?

W.J. McGee was born in 1853 and died in 1912. He spent a great deal of his life as a geologist, working at the United States Geological Survey under Major John Wesley Powell. When Powell became director of the Bureau of Ethnology, McGee followed. And when Powell stepped down due to health reasons, McGee was director-in-charge of the Bureau of Ethnology until 1903. His interest in water arose during his tenure at the St. Louis Exposition for the 1904 World's Fair where he came to see the tremendous value and opportunity of coordinated river development (Pisani, 2006). An ambitious figure, Franz Boas credits McGee as formative in helping to establish the American Anthropological Association. Anthropologically, McGee and Boas agreed on little, particularly because McGee sought consonance between his work in geology and his work in anthropology. Boas (1916) did not support the sort of deductive theorising that McGee carried on from his tutelage under Powell. In fact, he unswervingly criticised it even in his remarks at McGee's memorial meeting.

In the early 20th century, during the presidency of Theodore Roosevelt, McGee's position in Washington allowed him to combine his arguments about both geology and anthropology into a format for state resource planning known today as conservation. His contemporaries, such as Gifford Pinchot (1916: 21), credit him as the "scientific brains of the conservation movement all through its early and critical stages". It was McGee's vision of conservation that drove the Inland Waterways Commission established by Roosevelt; a commission that has been described as the most important committee struck for national resource planning in the early 20th century (Wescoat, 2000). McGee was also influential in the convening of the 1908 conference of state governors and the president on the conservation of the nation's resources. He was the meeting's secretary, and wrote the speech that Roosevelt delivered to it (Oravec, 2004). The aim of conservation was to provide a philosophical basis for federal resource planning. And these arguments would later provide the rhetorical space for legitimising the TVA as a unique accomplishment of American liberalism (see Lilienthal, 1944; Schlesinger, 1949).

McGee's vision of the hydrologic cycle was based on H_2O. But if we look at McGee's published writings on hydrology, which are missing from Linton's (2010) account, we find water was neither passive nor socially inert. In his *Outlines of hydrology*, McGee (1908) motivates an account of water's agency based on ideas from geology. Broadly put, McGee and others in the late 19th century were interested in what they described as "earth-making" – an attempt to give a unified account of social and natural processes based on the principles of planetary evolution, particularly Charles Lyell's principle of uniformitarianism (Lacey, 1979). The idea of uniformitarianism – that the present is the key to the past – can be seen, as Rudwick (2007) suggests, alongside attempts to see the earth as having a unique and contingent history. Although not initially at odds with theories that allowed (or required) the intercession of non-natural or supernatural forces to shape landscapes through catastrophic events, like

biblical floods, the idea was secular. In this way, 'earth-making' sought to connect the contingent history of the earth to the contingent histories of human evolution and, ultimately, to the study of human evolution: anthropology (McGee, 1894, 1901). These types of arguments signalled the end of attempts to fit water, the hydrological cycle, and natural theology (see Tuan, 1968).

Beginning from this geologic basis, McGee (1908: 197) describes H_2O as the 'mineral' that forms the hydrosphere by arguing that,

> …viewed as a whole the hydrosphere takes on a significant, or at least suggestive, character which may be likened to the automacy [sic]…of the organic world and the autonomy of the human world – it assumes a semblance of self-activity in its changes of state and movements in space which tends to facilitate its own working and perpetuate its own efficiency as a planet-shaping agency, for example, in that its presence is necessary to the temperature of the planet which in turn regulates its changes and movements.

Based on the hydrosphere's planet-shaping agency, McGee builds an account of hydrology that links water to social evolution. McGee (1908: 200) starts by arguing that, "As part of the hydrosphere, the stream exists and moves; as an agency, it works; as a worker, it modifies its environment and itself". This work of the stream, argues McGee, reflects a "continuous adjustment" between the chaotic internal movements of water and the external relations it has to other forces, such as geology and organic life. Elsewhere, McGee (1894) defines life itself as the ability to adjust internally and externally to the environment. In this sense, water's agency is a vital source for, and active force upon, the creation of landscapes that enable life itself. For instance, McGee (1908: 195) writes that water is,

> In its movement and changes of state the leading external agency of earth-making, it first brought forth and then gave form to the continents; and the organisms developed within it to reach higher estate on land depend on it both for the chief part of their substances and for all their vital processes. A growing and living world without water is unthinkable.

This focus on water's agency does not, however, defeat the claim that a reductionist vision of water, *qua* H_2O, underlies McGee's (1909) declaration of water as a resource. To defeat that claim, we must see how McGee characterised the hydrodynamics of H_2O. For it is here that McGee offers one of the first attempts to synthesise hydrology and hydrodynamics with water management. Interestingly, accounts of the hydrosocial cycle rarely, if ever engage the evolution of hydrodynamics. It should be noted, however, that historical work by Darrigol (2005) makes a strong case for how 19th century developments in hydrodynamics occurred in tandem, and at times in tension, with advances in hydrology. Nevertheless, the trend in hydrosocial critiques is towards an exclusive engagement with hydrology even though the early 20th century union of quantitative claims about hydrology and qualitative claims about water's behaviour from hydrodynamics provided the basis for American water planning.

McGee held a non-reductionist view where the behaviour of H_2O was the result of what he referred to as "water modules". McGee (1908: 206) argued that, "the discrete particle involved in stream movement cannot be a single molecule" because this would not allow water to have sufficient magnitude to undergo changes of state or have adequate surface tension to exhibit the behaviours it does. In this sense, H_2O functioned as a unit. As McGee (1908: 210, original emphasis) stated,

> Since the unit so conceived is the ultimate quantity of H_2O capable of functioning in the characteristic ways and is at the same time the prime determinant of the rhythmic movement of H_2O in masses, it is the natural measure and modulator of moving water and can hardly be denoted otherwise than as the *module* of H_2O.

From this evidence, it is clear that McGee did not hold a reductionist view of water. But before moving to a consideration of how McGee fit his 'water modules' to society it is important to highlight three things. First, McGee clearly held to a view in which water had agency across all parts of the

hydrosphere. Second, McGee did not hold a reductionist view but rather sought a union between hydrology and hydrodynamics as a means of understanding water's behaviour. Third, neither of these things is accounted for in historical claims regarding the hydrosocial cycle, such as those forwarded by Linton (2010). As such, there is room to reconsider arguments advanced for the hydrosocial cycle wherever they depend on these or similar claims.

It is not necessary to hold that McGee was right, or even that he foreshadowed the non-essentialist views of water found in contemporary scientific accounts of water, such as we find in van Brakel's (2000) claims regarding the lack of any particular micro-structure amongst the many ions (beside H_2O) that give water its unique characteristics (i.e. OH^-, H_3O). As Vandewall (2007) has argued, it is indeed possible to defend a position that water is not H_2O. But from a historical perspective, what is critical to note is that the nature of the chemical and hydrological advancements of the 19th century were far from settled (see Chang, 2012). As such, it is important to consider the historical specificity of how, in the American case, water was understood. Finally, the foregoing evidence is not being put forward in support of McGee. In many ways, he was profoundly misguided. The next section argues that it is *because* of McGee's notion of water's agency, and the way that this notion of agency functioned as a basis for conservation, that his fit of water and society is deeply problematic.

How do water resources fit society?

In 1909, a year after *Outlines of hydrology*, McGee published the essay *Water as a resource*. That essay and his subsequent 1911 piece on *Principles of Water-Power Development* both have features typically identified as modern. For instance, in the 1909 essay McGee provides a national inventory of US water, shows how an economic valuation of water can lead to increased efficiency and productivity, and compels the reader to view water resources as wholly owned subsidiaries of modern progress. The 1911 essay views water as a sort of evolutionary heritage of the US nation, replete with legal and ethical norms that are themselves justified by virtue of the unique characteristics of the American people and their institutions. McGee, however, does not make the sort of move required by proponents of the hydrosocial cycle that set up the management of water as an exercise issuing from state rationality. Quite the opposite. McGee actually critiques state rationality, particularly the US constitution, for its failure to recognise the importance of water. He then sets out conservation as a union of water, society and evolutionary progress consistent with his version of vitalism.

Versions of vitalism were popular in the early 20th century, particularly that of French philosopher Henri Bergson (1911), as ways to work around the divide between mind and matter in modern philosophy. McGee's particular version of vitalism, however, was not one built on evolutionary biology, as was Bergson's. Rather, it maintained fidelity to the view that agency was geological. The ontological basis for this came from Powell's work, which was published in 1898 in *Truth and Error: Or the Science of Intellection*. There, Powell argued against the modern division of mind from matter and the corollary dualism between society and nature. For an account of agency without metaphysical intercession, Powell (1898: 14) argued that, "every particle of matter has consciousness". In this view, the ultimate stuff of the cosmos was both mind and matter (Schmidt and Shrubsole, 2013). And, as matter increased in complexity and self-organisation through evolutionary development, the possibility for more complex forms of consciousness became concrete.

In an 1894 essay, McGee fully endorsed Powell's view because it suggested – following the geologic principle of uniformitarianism – that all forms of rationality on earth differ only by degree, not by kind. McGee's (1894: 16) full view is beyond the scope of this paper, but it begins with the unstable chemistry compounds of early planetary life that precariously start to self-organise and mutually adjust to their environment and their own effects on it. In this mutual exchange, the form of agency that arises out of geological processes gradually transformed the chaotic preconditions of non-life into directed evolutionary development. Once life began, 'the agency of all living things' further modified

the environment. This was the process of earth-making. And as we saw above, water was the self-organising agent of planetary evolution par excellence.

The vitalism of Powell and McGee was not only an attempt to develop an evolutionary account of life. It was also forwarded against theories of social or natural law, particularly the views of social Darwinism popular in the 19th century. In this context, their views were manifestly political. If we are to later compare their version of vitalism to others (see Normandin and Wolfe, 2013), or to recent versions in political ecology (e.g. Bennett, 2010), we must first see how it was entangled with a set of anthropological assumptions about the fit of geologic agency and evolutionary development. In McGee's (1899) view, human evolution developed in stages beginning in reference to the perceived constancy of nature. A new stage was inaugurated by Bacon and built upon by social scientists in which the aim was the control and manipulation of the 'variables of nature'. McGee saw his own work as a further stage. In it, the reflexive application of the knowledge generated by evolutionary development turned back upon itself. This was the scientific basis for anthropology. It was also the deductive premise criticised by later anthropologists because McGee (1897, 1899) supposed that evolution had a direction (though not a telos) and that this direction imputed a kind of solidarity among all living things that reached an apex in the scientific study of complexity itself. And this, *ipso facto*, privileged McGee's own cultural worldview.

Although McGee's view evolved over time, he maintained consistency on the continued possibility of evolution as absolutely dependent on water. In line with his vision of evolution as a process of mutual adjustment, McGee argued that the reciprocal relationships between more developed societies and their institutions provided the most defensible starting point for uniting the science of man (sic) with the agency of the earth. In his essay, *Principles of Water-power Development*, McGee (1911) argues that the US legal experience in common-law, particularly the judgment in *Hudson County Water Co. v. McCarter*, provided the template for linking the institutions that had evolved to that point with the emergence of the unified vision that underpinned the idea of conservation and of which water was the vital resource. McGee (1911: 817) wrote that,

> As the prime necessary of life – the ultimate basis of existence for each of the individuals united in the nation – the water of the country is, under that leading principle of our national existence that all men are equally entitled to life, liberty and the pursuit of happiness, the common and indivisible possession of all – a possession in equity inalienable and indefeasible since no constituent of the nation could alienate or divest himself of his share without surrendering his right to life and so weakening the nation.

For McGee, the 'ultimate basis' for national wealth and individual welfare was provided for by water. McGee took this shared basis to imply that water belongs to the community that gave legitimacy to the American state itself – the public ownership of which is inherent in the rights of any and all individuals who are party to that community. Throughout the 1911 essay, McGee repeatedly reinforced the idea that water is a community resource and concluded that water ought to be governed in the "public interest in accordance with the righteous principles of the greatest good to the greatest number for the longest time" (McGee, 1911: 825).

It was not correct, in McGee's view, to apply social or natural laws to abstract visions of water or of US society. To take such a view would not allow for the continued evolution of social progress or scientific rationality. This is where McGee's vision troubles accounts of high modernism that argue for a set of idealised norms about the nature of a 'population' as the basis for water planning. The progressive ideal underlying McGee's view, which the TVA's second director David Lilienthal returned to (see Lilienthal, 1944; Wescoat, 2000), is that the conditions that made possible the emergence of the national characteristics of the US people are what water management should be oriented towards maintaining. And these conditions were not established by the state. Rather, they were the co-evolutionary outcome of how 'the People' of the US and their institutions had developed (McGee, 1896; see also Oravec, 2004). In this way, McGee can be seen as an exemplar of what Taylor (2004) describes

in terms of the modern social imaginary where a 'pre-political' people form common understandings of moral and material orders that legitimate the constitutional state itself.

To appreciate the consistency of McGee's view, it is worth tracing it out in a bit more detail. Recall that McGee's view was that modular units of water provided the building blocks for seeing river systems as complex units wherein multiple agents mutually adjusted to one another. In this way, the watershed was the preferred unit for planning because it reflected the co-evolution of multiple human and non-human agents and relations among them. Since those relationships supported the rise of society and its internal relationships, as well as its external relationships to the environment, institutions should be designed accordingly.

From this position, McGee criticised the American constitution because it was founded without any regard for water at all. For instance, the Proceedings of the Anthropological Society of Washington on 12 October 1909 record a paper entitled *Conservation in the Human Realm* presented by McGee. The summary of that paper as found in the minutes for the meeting render McGee's argument as follows (Swanton, 1910: 160):

> At first water was neglected as a mere appurtenance to land; and now that it is recognised as the primary resource – that on which all life depends, so that it gives value to all the rest – it also is passing under a monopolistic control whereby all citizenship will tend to merge into industrial dependence on centralised power. The situation is one of the gravest ever confronted by any people in the world's history, graver than any ever survived by a nation; and it behoves those possessing the advantage of scientific training and knowledge of principles to give it earnest consideration – and to aid in defining the interrelated duties of the individual, the family and the state in ways tending toward the perpetuity of our people. A lengthy discussion of this paper closed the meeting.

The notion that water was a "mere appurtenance to land" was, for McGee, as it had been for Powell his predecessor, an empirically misguided basis for statecraft. As Worster (2003) argued, Powell had held to a vision of 'watershed democracy' that would see the people affected by water policies directly involved in decision-making. But McGee pushes this line farther, arguing that the exclusion of water from the political geography of the state was misguided because water was the primary geologic and social agent of evolutionary development. As such, an individual's right to water ought to be reflected in the constitution of the state because the constitution is the reflection of the will of 'the People'. For McGee (1915: 100) four key principles grounded the philosophy of Conservation such that it could keep the as-of-yet unfulfilled promise of Fraternity under the American constitution. These, as he enumerated in an essay on *The Conservation of Natural Resources*, were:

1. The equal rights of all men to opportunity.
2. The equal rights of the People in and to resources rendered valuable by their own natural growth and orderly development.
3. The equal rights of present and future generations in and to the resources of the country.
4. The equal rights of citizens to provide for the perpetuity of families and States and the Union of States.

McGee's aim of securing individual rights to water in a water-aware state targeted the *laissez-faire* resource economics of the 19th century (Merchant, 1997; see generally Lacey, 2000). As an earlier quote suggested, McGee saw the threat of industrial resource monopolies as the gravest ever confronted. I suggest that we interpret McGee's consolidation of water (as the most vital resource of a nation) within institutions of collective and public ownership as a way to safeguard against economic exploitation that undermined the rights of individuals and, ultimately, the evolutionary prospects of 'the People'. As Lacey (1993) has argued, both Powell and McGee can be seen as holding a 'liberal positivism' where the traits of individualism identified by liberal theorists provide a basis for

understanding the social interaction that legitimates institutions. Thus, it is by virtue of the characteristics and institutions uniquely created and shared by the US people that the union of water to the state is accomplished. This is what enables McGee's happy union of the 'righteous' utilitarian principles that he took from J.S. Mill – the greatest good for the greatest number – to be reformulated in evolutionary terms – *for the longest time*.

McGee's starting point for this nationalised vision turns on his formulation of vitalism. It links individuals as the units of society to the modular units of water that sustained their internal and external relations. In his essay, *Desert Thirst as Disease*, McGee (1988) argues that we should treat individual thirst in medical terms, as similar to a kind of cancer caused by want of water. Because individual health depends on water, and because individuals are the building blocks of society, priority should be placed on matching the modular units of water to the modular units of society. This is what would ensure the health of the nation. It is worth noting that McGee's view of water's agency is dominated by metaphors based on the actions of streams (i.e. not of lakes). And this leads McGee (1906) to argue that the watershed is the appropriate unit for ensuring that individual development and national security are secured as part of a mutual co-evolution of institutions and the environment. As the Lakes-to-the-Gulf Deep Waterway Association (1916: 28) submitted to McGee's memorial meeting:

> He regarded a river system as a unit from source streams to the sea; and that its problems should be treated as a whole, so as to develop in one solution all the collateral utilities – not only regularity in flow and fixation of beds and banks, but also reclamation, waterpower, and sanitation.

McGee's vision of society is not one that rationalises cultural phenomena or social statistics into an idealised 'population' in the manner theorised by high modernism. Rather, his view is that the characteristics of a particular People, the American nation, provide warrant for enhancing the prospects of its own form of life because it exhibits the scientific, legal and institutional basis for rendering water a resource that can be put into evolutionary service *for that specific community*. In this way, McGee's anthropological gaze is thoroughly ethnocentric in its dismissal of alternative forms of life, such as those found in the diversity of North American indigenous societies. The US case, then, was not an idealised example for McGee that found justification in social or natural laws. Nor was the US case to be radicalised in favour of abstracted ideals of rationality. Rather, it was an empirically justified case based on conclusions deduced from the general facts about evolution to the specific case of America.

VITALISM ATROPHIED

McGee's form of liberalism was particularly inspirational for the second director of the TVA, David Lilienthal (1944), who forwarded the cultural norms of American democracy through watershed development on an international scale (see Sneddon and Fox, 2011; Sneddon, 2012). However, and especially after WWII, vitalist ideas fell out of favour in line with a broad distancing of academics and politicians from claims about the unique characteristics of nations (see Norton, 2005). Yet the remnants of vitalism persist in key institutions. For instance, Bergson's vastly more popular version of vitalism was transposed into the original draft of the Universal Declaration of Human Rights (Curle, 2007). And in the water sector, the idea that individuals hold a public right to water, and that water is owned collectively, were fortified by the institutional frameworks supporting resource conservation. In this concluding section, I take up two questions. First, has too much emphasis been put on McGee's philosophy as a way to historicise the claims of the hydrosocial cycle? Second, if this sort of vitalism has now atrophied, what difference does it make in accounts of the hydrosocial cycle?

In response to the first question, McGee's declaration that water is a resource has been interpreted as emblematic of the union between a reductionist view of water and a modernist vision of society (i.e. Linton, 2010). This is one reason to give special emphasis to it. A broader, secondary argument for tracking McGee's ideas is that they provide the philosophical backdrop for the particular kind of

watershed management later instantiated by the TVA (see Wescoat, 2000). Because the TVA is so frequently targeted by proponents of the hydrosocial cycle, McGee's ideas merit close consideration. For instance, one of his final publications was on the potable waters of the eastern United States and was in wide demand as water development and pollution concerns grew (Darton, 1913). Further, and perhaps most problematically, McGee's ethnocentric ideas are harboured in notions now widely accepted in the water sector, such as the idea that water is a resource that should be conserved to increase human welfare. This utilitarianism pervades US water policy and is also found in the international arena where the US has often taken a key role in development policies (see Feldman, 1995, 2007; Blatter and Ingram, 2001; Boelens et al., 2010).

McGee's arguments for non-human agency also provide a different mechanism linking water, society and non-humans. It is one that suggests caution when theories of modernity are employed to organise historical claims. McGee's version actually suggests a much stronger version of anthropocentrism than allowed for under ideas of a human-nature dualism. In the latter, 'nature' provides a reservoir from which humans appropriate resources to increase their lot (Brown, 2004), and through which forces of political economy then co-produce new 'natures' (e.g. Swyngedouw, 2004). But in the former, the full control of water is actually a requirement for co-evolutionary progress. And this imperative is one that is deeply rooted in the broader ethnocentric vision of 'the People' *for whom* McGee seeks to naturalise the US constitution and its institutions. So, although it has now atrophied, McGee's vitalism casts the anthropological die of key US institutions of resource planning, watershed management and conservation by orienting them towards the promotion of utilitarian and broadly liberal norms. Later, the eminent American water manager Gilbert F. White (1945) would cite McGee's call for closer attention to the mutual adjustment between humans and rivers as salient for planning in the 20th century. Furthermore, when the American model is cited in subsequent international constructions of 'the public' we find warrant for attending to the implicit cultural assumptions grafted into the language of institutions such as the World Bank (see Bakker, 2013).

Giving special emphasis to McGee also unearths an unaddressed dimension of arguments for the hydrosocial cycle itself. Since these imply that something was lost that is now being recovered (i.e. nature was emptied of agency that is now being recognised) there is a deeper project that also must be undertaken, which is to address the anthropological, and often colonial, assumptions at work in ideas that claims to water can or must be made in the constitutional language of the state. McGee provides clear evidence for wanting to secure water to the constitutional language of the state. But these kinds of efforts have been significantly criticised by theorists, such as James Tully (1995), who argue that respecting alternate cultural forms of life *on their own terms* requires repositioning the language and practices of constitutional agreements from monological cultural formats to dialogical models in which competing claims articulate with one another without being subsumed under a dominant cultural norm. In this way, treating water as a total social fact also requires attending to the heterogeneous and different notions of 'the social' that affect its management and governance.

In consideration of the second question: if vitalism has atrophied, why does it matter? The obvious and important point here is that water histories matter, especially when they are deployed to motivate arguments for new policy or governance directions. A second is that, although many water historians (and historians in general) do not suppose a 'total history' of particular periods or schools of thought is the aim of history (see Blackbourn, 2006), these sorts of total histories do play a role in the design of earlier institutions. Because of this, the use of vitalism as a domain within which to link earth's evolutionary history, water modules, social individuals, state constitutions and institutions for conservation would seem a salient point of departure for understanding subsequent efforts in water management. And, in particular, why the types of regional water planning agencies that issue from the US experience and its political economy have so often failed in the task of uniting different values or forms of life into practical governance schemes (Ingram, 1973; Feldman, 1995; Espeland, 1998; Reuss, 2008).

With regard to specific arguments for the hydrosocial cycle, attending to earlier iterations of vitalism is directly relevant to arguments that suggest making out water or non-humans as 'actants' departs from the predominant narrative of modern water management. It is clear that water was an active agent in the US case, and critiques that build from primary or secondary work with regard to that case should at least be addressed to earlier attempts to grapple with water's agency. So we should confront theories of the hydrosocial cycle that see earlier 'modern' perspectives, at least in the US case, as initially devoid of hydrosocial content that is then identified in the outcomes of different policies. Once we see that an earlier version of the hydrosocial cycle was formed explicitly in the historical record there is a broader account made available, one that does not turn on questions of co-production alone, but on the active attempts at co-evolutionary and ethnocentric design in resource planning.

Finally, it is also worthwhile to address accounts of the hydrosocial cycle more clearly to the historical philosophies that laid the groundwork for the predominant governance schemas being critiqued. McGee's version of vitalism supported an ethnocentric view that legitimated (in his view) the development and management of watersheds in support of the American people. By recognising this context, an opportunity is created for putting the US case into conversation with contemporary views of vitalism in political ecology regarding who and what acts towards, or counts as part of, the political and moral communities affected by environmental policies (e.g. Bennett, 2010). In this way, engagements with theories about modernity can be supplemented by understanding the contingent intellectual heritage of water management itself. Since McGee crafted a version of the hydrosocial cycle, arguments that distinguish between historical versus contemporary iterations will help to clarify the contribution of the emerging literature on the hydrosocial cycle.

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